

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 7,163,946 B2
APPLICATION NO. : 10/684212
DATED : January 16, 2007
INVENTOR(S) : Lin Zhi et al.

Page 1 of 10

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

IN THE TITLE PAGES:

In Item [56] References Cited, in OTHER PUBLICATIONS:

in Chemical Abstracts, vol. 87, No. 13, please replace "Migachev, et al." with
--Migachev, et al.--

in Database CAPLUS, Chemical Abstracts AN=1975:111718, please replace "1295" with --1292--

in Database CAPLUS, Chemical Abstracts AN=118:147477, please replace
“Preparation of” with --Preparation of--

in Database Crossfire Beilstein 'Online!', XP 002002690, please replace "101-101" with --100-101--

in Database Crossfire Beilstein 'Online!', XP 002002692, please replace "Online!" with --'Online! -- and please replace "457" with --57--

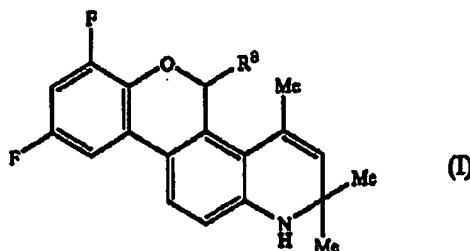
in Database Crossfire Beilstein 'Online!, XP 022002695, please replace "48005330" with --4800533--

in Samsonova et al., please replace “et al.” with --et al.--

At column 7, in Table A, row 1, please replace “ R_1 ” with $-R^1$ —
 at column 7, in Table A, row 2, please replace “ R_2 ” with $-R^2$ —
 at column 7, in Table A, row 3, please replace “ R_3 ” with $-R^3$ —
 at column 7, in Table A, row 4, please replace “ R_4 ” with $-R^4$ —
 at column 7, in Table A, row 5, please replace “ R_5 ” with $-R^5$ —
 at column 7, in Table A, row 6, please replace “ R_6 ” with $-R^6$ —
 at column 7, in Table A, row 7, please replace “ R_7 ” with $-R^7$ —
 at column 7, in Table A, row 8, please replace “ R_8 ” with $-R^8$ —
 at column 7, in Table A, row 9, please replace “ R_9 ” with $-R^9$ —
 at column 7, in Table A, row 10, please replace “ R_{10} ” with $-R^{10}$ —
 at column 7, in Table A, row 11, please replace “ R_{11} ” with $-R^{11}$ —

Please replace Claims 1, 5, 9, 11, 12, 13, 20 and 23 with the following Claims:

--1. A compound of the formula:

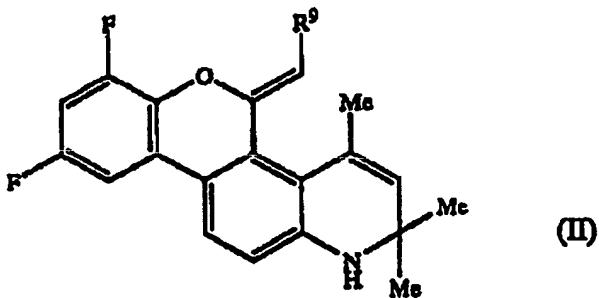


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or

wherein:

R⁸ is selected from the group of C₁-C₁₂ alkyl, C₁-C₁₂ heteroalkyl, C₁-C₁₂ haloalkyl, C₂-C₁₂ alkenyl, C₂-C₁₂ heteroalkenyl, C₂-C₁₂ haloalkenyl, C₂-C₁₂ alkynyl, C₂-C₁₂ heteroalkynyl, C₂-C₁₂ haloalkynyl, aryl and heteroaryl, optionally substituted with one or more substituents independently selected from the group of hydrogen, C₁-C₄ alkyl, F, Cl, Br, I, CN, NO₂, NH₂, NHCH₃, N(CH₃)₂, SH, SCH₃, OH, OCH₃, OCF₃, CF₃, C(O)CH₃, CO₂CH₃, C(O)NH₂, OR¹⁰, SR¹⁰, and NR¹⁰R¹¹,

R⁹ is selected from the group of hydrogen, F, Cl, Br, I, CN, C₁-C₈ alkyl, C₁-C₈ heteroalkyl, C₁-C₈ haloalkyl, C₂-C₈ alkenyl or cycloalkenyl, C₂-C₈ heteroalkenyl, C₂-C₈ haloalkenyl, C₂-C₈ alkynyl, C₂-C₈ heteroalkynyl, C₂-C₈ haloalkynyl, aryl and heteroaryl, optionally substituted with one or more substituents independently selected from the group of hydrogen, C₁-C₄ alkyl, F, Cl, Br, I, CN, NO₂, NH₂, NHCH₃, N(CH₃)₂, SH, SCH₃, OH, OCH₃, OCF₃, CF₃, C(O)CH₃, CO₂CH₃, C(O)NH₂, OR¹⁰, SR¹⁰, and NR¹⁰R¹¹;

R¹⁰ and R¹¹ each independently is hydrogen, or C₁-C₄ alkyl; or a pharmaceutically acceptable salt thereof.

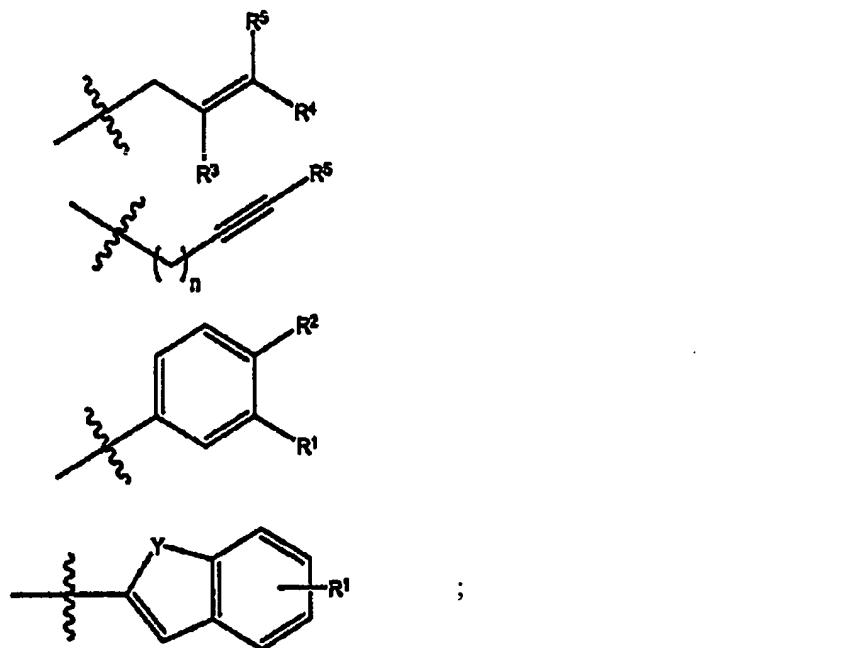
5. A compound according to claim 2, wherein R⁸ is selected from the group of

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It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:



wherein:

R¹ and R² each independently is selected from the group of hydrogen, F, Cl, Br and C₁-C₄ alkyl;

R³ through R⁵ each independently is selected from the group of hydrogen, F, Cl, and C₁-C₄ alkyl;

n is 0 or 1; and

Y is selected from the group of O, S, and NR¹⁰.

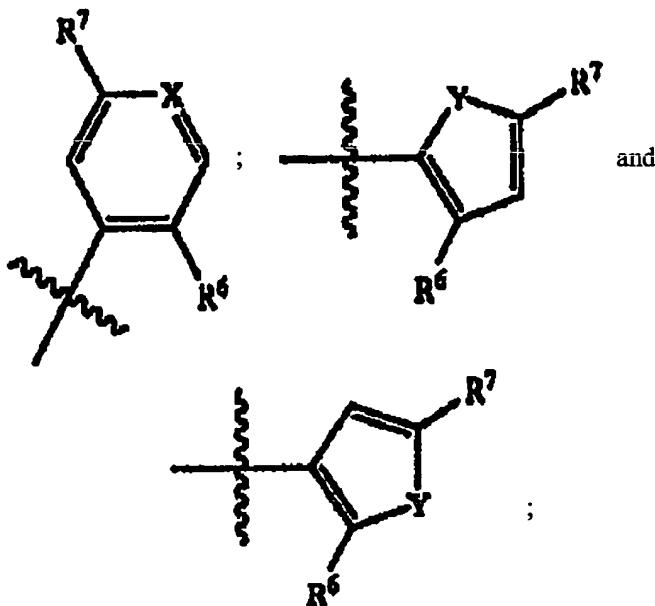
9. A compound according to claim 6, wherein R⁹ is selected from the group of

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wherein:

R^6 is selected from the group of hydrogen, F, Cl, Br, C₁-C₄ alkyl, OR¹⁰, SR¹⁰, and NR¹⁰R¹¹;

R^7 is hydrogen, F, or Cl;

R¹⁰ and R¹¹ each independently is hydrogen, or C₁-C₄ alkyl;

X is CH or N; and

Y is selected from the group of O, S, and NR¹⁰.

11. A compound according to claim 9, wherein R⁶ is selected from the group of F, Me, Et, OMe, OEt, SMe, and NMe₂.

12. A compound according to claim 1, wherein said compound is selected from the group of:

7,9-difluoro-5(Z)-benzylidene-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 10);

7,9-difluoro-5(Z)-(2-fluorobenzylidene)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 12);

7,9-difluoro-5(Z)-(2-chlorobenzylidene)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 13);

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7,9-difluoro-5(Z)-(4-picolylidene)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 14);
7,9-difluoro-5(Z)-(3-fluorobenzylidene)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno-[3,4-f]quinoline (Compound 15);
7,9-difluoro-5(Z)-(4-fluorobenzylidene)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno-[3,4-f]quinoline (Compound 16);
7,9-difluoro-5(Z)-(2,5-difluorobenzylidene)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno-[3,4-f]quinoline (Compound 17);
7,9-difluoro-5(Z)-(2-methoxybenzylidene)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno-[3,4-f]quinoline (Compound 18);
7,9-difluoro-5(Z)-(2-methyl-5-fluorobenzylidene)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 19);
7,9-difluoro-5(Z)-(3-methyl-4-picolylidene)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 20);
7,9-difluoro-5(Z)-(2-methyl-3-fluorobenzylidene)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 21);
7,9-difluoro-5(Z)-(3-methyl-2-picolylidene)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 22);
7,9-difluoro-5(Z)-(2,3-dimethylbenzylidene)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 23);
7,9-difluoro-5(Z)-cyanomethylidene-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 24);
7,9-difluoro-5(Z)-hexylidene-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 25);
7,9-difluoro-5(Z)-(2-methoxy-5-fluorobenzylidene)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 26);
7,9-difluoro-5(Z)-(2,4,5-trifluorobenzylidene)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 27);
7,9-difluoro-5-methylidene-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 28);
7,9-difluoro-5(Z)-bromomethylidene-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 29);
7,9-difluoro-5(Z)-(3-thienylmethylidene)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 30);
7,9-difluoro-5(Z)-(2-thienylmethylidene)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 31);
(±)-7,9-difluoro-5-methoxy-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 32);
(±)-7,9-difluoro-5-phenyl-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 33);

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(±)-7,9-difluoro-5-(3-methylphenyl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 34);
(±)-7,9-difluoro-5-(1,3-benzodioxol-5-yl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 35);
(±)-7,9-difluoro-5-(4-bromophenyl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 36);
(±)-7,9-difluoro-5-(4-chloro-3-methylphenyl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 37);
(-)-7,9-difluoro-5-(4-chloro-3-methylphenyl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 38);
(+)-7,9-difluoro-5-(4-chloro-3-methylphenyl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 39);
(±)-7,9-difluoro-5-(3-fluorophenyl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 40);
(±)-7,9-difluoro-5-(3-chlorophenyl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 41);
(±)-7,9-difluoro-5-(3-bromophenyl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 42);
(±)-7,9-difluoro-5-(4-chlorophenyl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 43);
(±)-7,9-difluoro-1,2-dihydro-2,2,4,5-tetramethyl-5H-chromeno[3,4-f]quinoline (Compound 44);
(±)-7,9-difluoro-5-(2-oxo-2-phenylethyl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 45);
(±)-7,9-difluoro-5-ethyl-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 46);
(±)-7,9-difluoro-5-ethenyl-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 47);
(±)-7,9-difluoro-5-(2-oxo-3-butenyl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 48);
(±)-7,9-difluoro-1,2-dihydro- $\alpha,\alpha,2,2,4$ -pentamethyl-5H-chromeno[3,4-f]quinoline-5-ethanoate (Compound 49);
(±)-7,9-difluoro-5-ethynyl-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 50);
(±)-7,9-difluoro-5-cyano-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 51);
(±)-7,9-difluoro-5-butyl-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 52);
(±)-7,9-difluoro-5-(2-thienyl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 53);

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(±)-7,9-difluoro-5-(2-furyl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]-quinoline (Compound 54);
(±)-7,9-difluoro-5-allyl-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]-quinoline (Compound 55);
(±)-7,9-difluoro-5-[3-(trifluoromethyl)phenyl]-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 56);
Ethyl (±)-7,9-difluoro-1,2-dihydro- α -methylene-2,2,4-trimethyl-5H-chromeno[3,4-f]-quinoline-5-propanoate (Compound 57);
(±)-7,9-difluoro-1,2-dihydro- β -methylene-2,2,4-trimethyl-5H-chromeno[3,4-f]-quinoline-5-propanol (Compound 58);
(±)-7,9-difluoro-1,2-dihydro- β -methylene-2,2,4-trimethyl-5H-chromeno[3,4-f]-quinoline-5-propanol acetate (Compound 59);
(±)-7,9-difluoro-5-(1-methylethethyl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]-quinoline (Compound 60);
(±)-7,9-difluoro-5-(N-methyl-2-pyrrolyl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 61);
(±)-7,9-difluoro-5-phenylethynyl-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]-quinoline (Compound 62);
(±)-7,9-difluoro-5-(benzo[b]thien-2-yl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]-quinoline (Compound 63);
(-)-7,9-difluoro-5-(benzo[b]thien-2-yl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]-quinoline (Compound 64);
(+)-7,9-difluoro-5-(benzo[b]thien-2-yl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]-quinoline (Compound 65);
(±)-7,9-difluoro-5-(5-methyl-2-furyl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]-quinoline (Compound 66);
(±)-7,9-difluoro-5-(2-benzo[b]furyl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]-quinoline (Compound 67);
(±)-7,9-difluoro-5-[4-(dimethylamino)phenyl]-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 68);
(±)-7,9-difluoro-5-(5-methyl-2-thienyl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]-quinoline (Compound 69);
(±)-7,9-difluoro-5-(5-methoxy-2-furyl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]-quinoline (Compound 70);
(±)-7,9-difluoro-5-(2-propynyl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]-quinoline (Compound 71);
(-)-7,9-difluoro-5-(2-propynyl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]-quinoline (Compound 72);
(+)-7,9-difluoro-5-(2-propynyl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]-quinoline (Compound 73);

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(±)-7,9-difluoro-5-(1-propynyl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 74);
(-)-7,9-difluoro-5-(1-propynyl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 75);
(+)-7,9-difluoro-5-(1-propynyl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 76);
(±)-7,9-difluoro-5-(4,5-dimethyl-2-furyl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 77);
(±)-7,9-difluoro-5-(2-methyl-1-propenyl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 78);
(±)-7,9-difluoro-5-(3,4-dimethyl-2-thienyl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 79);
(±)-7,9-difluoro-5-(3-(3-bromophenyl)phenyl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 80); and
7,9-difluoro-5-(2-methylbenzylidene)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 81).

13. A compound according to claim 1, wherein said compound is selected from the group of:
7,9-difluoro-5(Z)-benzylidene-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 10);
7,9-difluoro-5(Z)-(2-fluorobenzylidene)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 12);
7,9-difluoro-5(Z)-(3-fluorobenzylidene)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 15);
7,9-difluoro-5(Z)-(2,5-difluorobenzylidene)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 17);
7,9-difluoro-5(Z)-(2-methoxybenzylidene)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 18);
7,9-difluoro-5(Z)-(2-methyl-5-fluorobenzylidene)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 19);
7,9-difluoro-5(Z)-(3-methyl-4-picolylidene)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 20);
7,9-difluoro-5(Z)-(2-methoxy-5-fluorobenzylidene)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 26);
7,9-difluoro-5(Z)-(3-thienylmethylidene)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 30);
7,9-difluoro-5(Z)-(2-thienylmethylidene)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 31);
(±)-7,9-difluoro-5-(3-methylphenyl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 34);

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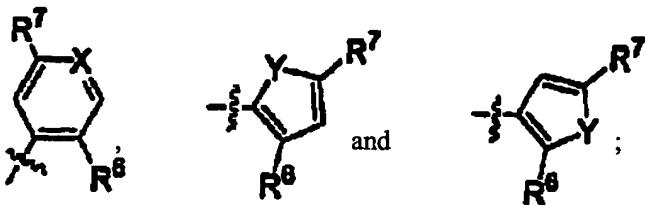
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(-)7,9-difluoro-5-(4-chloro-3-methylphenyl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 38);
(±)-7,9-difluoro-5-(3-chlorophenyl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 41);
(±)-7,9-difluoro-1,2-dihydro-2,2,4,5-tetramethyl-5H-chromeno[3,4-f]quinoline (Compound 44);
(±)-7,9-difluoro-5-allyl-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 55);
(±)-7,9-difluoro-5-(3-trifluoromethylphenyl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 56);
(±)-7,9-difluoro-5-(benzo[b]thien-2-yl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 63);
(-)7,9-difluoro-5-(benzo[b]thien-2-yl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 64);
(+)-7,9-difluoro-5-(benzo[b]thien-2-yl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 65);
(-)7,9-difluoro-5-(2-propynyl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 72);
(-)7,9-difluoro-5-(1-propynyl)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 75); and
7,9-difluoro-5-(2-methylbenzylidene)-1,2-dihydro-2,2,4-trimethyl-5H-chromeno[3,4-f]quinoline (Compound 81).

20. A pharmaceutical composition according to claim 15, wherein R⁹ is selected from the group of hydrogen, F, Cl, Br, CN, C₁-C₆alkyl, C₁-C₆heteroalkyl, C₁-C₆haloalkyl, C₂-C₆alkenyl or cycloalkenyl, C₂-C₆heteroalkenyl, C₂-C₆haloalkenyl, C₂-C₆alkynyl, C₂-C₆heteroalkynyl, C₂-C₆haloalkynyl, aryl and heteroaryl, optionally substituted with one or more substituents independently selected from the group of hydrogen, C₁-C₄alkyl, F, Cl, Br, I, CN, NO₂, NH₂, NHCH₃, N(CH₃)₂, SH, SCH₃, OH, OCH₃, OCF₃, CF₃, C(O)CH₃, CO₂CH₃, C(O)NH₂, OR¹⁰, SR¹⁰, and NR¹⁰R¹¹.

23. A pharmaceutical composition according to claim 22, wherein R⁹ is selected from the group of



UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

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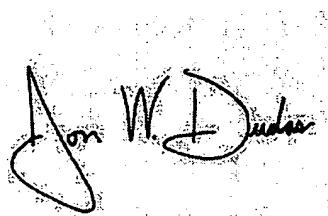
It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

wherein:

R^6 is selected from the group of hydrogen, F, Cl, Br, C₁-C₄ alkyl, OR¹⁰, SR¹⁰, and NR¹⁰R¹¹;
 R^7 is hydrogen, F, or Cl;
 R^{10} and R¹¹ each independently is hydrogen, or C₁-C₄ alkyl;
X is CH or N; and
Y is selected from the group of O, S, and NR¹⁰--

Signed and Sealed this

Twentieth Day of March, 2007



JON W. DUDAS
Director of the United States Patent and Trademark Office